WHAT IS CLAIMED IS:

1. A servo control loop for controlling a position of a head over a disc in response to a reference signal, the disc having pre-written servo tracks and an axis of rotation, the servo control loop comprising:

a servo controller having a control signal that is generated in response to a position error signal (PES);

an actuator mechanism coupled to the head and adapted to position the head in response to the control signal;

a transducer carried by the head having an output signal that is produced in response to the pre-written servo tracks;

a demodulator having a head position signal that is produced in response to the output signal, wherein the head position signal and the reference signal are combined to form the PES; and

compensation circuitry having a compensation signal that is generated based upon a compensation equation representing repeatable runout (RRO) caused by eccentricity between the pre-written servo tracks and the axis of rotation of the disc, wherein the compensation signal provides compensation for the RRO.

2. The servo control loop of claim 1, wherein the compensation signal is subtracted from a signal selected from a group consisting of the reference signal, the control signal, and the output signal.

3. The servo control loop of claim 1, wherein the compensation signal is added to the head position signal.

4. The servo control loop of claim 1, wherein the compensation equation includes discrete compensation values which represent the RRO at each of the servo tracks.

5. The servo control loop of claim 4, wherein the discrete compensation values are stored in a look-up table.

6. In a servo control loop, a method of compensating large, repeatable runout (RRO) caused by eccentricity between pre-written servo tracks on a disc and a path followed by a head that is concentric with an axis of rotation of the disc, the method comprising steps of:

(a) forming a compensation equation representing the RRO;

(b) generating a compensation signal based upon the compensation equation; and

(c) injecting the compensation signal into the servo control loop to cancel the RRO and cause the head to follow a virtual track that is concentric to the axis of rotation of the disc.

7. The method of claim 6, wherein the forming step (a) comprises:

(a)(1) positioning the head at a fixed radial position relative to the axis of rotation of the disc;

(a)(2) measuring a position error signal (PES) corresponding to a difference between a head position signal relating and a reference signal, wherein the PES relates to the RRO;

(a)(3) setting compensation values in accordance with the PES; and

(a)(4) forming the compensation equation using the compensation values.

8. The method of claim 7, wherein the compensation values relate to discrete radial position differences between the position of the head and the reference track as measured at each servo track.

9. The method of claim 6, further comprising:

(d) repeating steps (a), (b) and (c) for each disc in a disc drive, wherein a compensation equation is formed for each head of the disc drive corresponding to the discs;

(e) measuring a reference position of each head while maintaining the heads in fixed relation to each other; and

(f) establishing a reference virtual track at each of the reference positions, whereby the disc drive can operate in a cylinder mode.

10. A servo control loop for controlling a position of a head over a disc having pre-written servo tracks which are eccentric to an axis of rotation of the disc, the servo control loop comprising:

(a) a servo controller adapted to generate a control signal in response to a position error signal; and

(b) means for compensating the control signal for repeatable runout relating to the eccentricity between the pre-written servo tracks and the axis of rotation of the disc.